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## WHAT I SAW IN THE MINES OF SOUTH WALES AND ENGLAND DURING THE SUMMER.

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BY CAPTAIN J. L. MORRIS.

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*Mr. President, Gentlemen of the Institute :*

Several months spent in the mines and among the miners of England and Wales convinced me last summer that they not only know how to bring forth the black diamonds from the murky blackness of impenetrable gloom, but the hardy workers and the brainy engineers have devised and planned systems which could be emulated in other portions of the world with profit. It is my purpose to tell you a little of what I saw when abroad, and I trust you will remember, if the recital seems dry, that facts, plain and simple always possess more or less of that element.

Tredegar is a town in the mountains of South Wales, a typical coal and iron community. There the Tredegar Iron Works Company have one slope and eight pits in which the same seam is worked, the depths varying from one thousand to one thousand five hundred feet. The dip is on the butts of the coal. The first pair of pits is known as the Witwith and are two hundred yards in depth. Ventilation comes from a great fan of improved pattern which propels two hundred thousand cubic feet of air through the mine every minute. The seam is seven feet of pure coal, and after screening, the lump is sent to the sea board, while the nut and slack are coked into a bright and solid substance that will hold any kind of burden in a blast furnace.

The long wall system of mining prevails in all the pits, which means that all the coal is taken out, leaving no pillars whatever after the mine advances three hundred yards from the bottom of the shaft. The shafts are bricked the entire length, making them perfectly safe.

The underground haulage is always a cable, tail or endless rope. Each mine has a boss, assistant and several fire bosses, the colliery manager being over all. The system is perfect and the discipline fine, an absolute necessity, when the great amount of carbureted hydrogen gas generated in the mine is considered.

Great credit is due the company for the care they take and the provisions made for the comfort of their men. The lower pits of the company are one thousand seven hundred and fifty feet deep and worked in much the same way.

Mr. Thomas Reynolds, a young man of rare ability, is colliery manager. The general manager is Mr. Rutledge, a fine gentleman and a perfect mining engineer.

The Bidwettly pits were sunk when I was a boy, and often have I gone down in the dark hole as a trapper, not yet a dozen years of age, being as some of the old people told me last summer, the first boy to make the trip. At that time they worked the upper seam, but that has been exhausted, and the entries are now being driven in the second, and so wonderful is the coal of the country that when this is done the shaft will go deeper in the earth where still another vein awaits the coming of the miner. The haulage could not be better in every mine the company owns, and the ventilation is a marvel of perfection. No naked lights are allowed, and those men who have always worked in the gas, value their lives too highly to spend an hour under ground without a safety lamp by their sides. They have several improved lamps of this character, one of the latest patterns having been given me by the managers.

The next place of importance that I visited was the Gilymer colliery at Abercam, near Newport, about sixteen miles from Tredegar. Here we find a plant fitted out with all the improvements that vast wealth and modern skill can devise. The long wall system is also used here, and the fan is forty-five feet in diameter. It is under the management of J. M. Wallace, a thorough engineer, and the treasurer of the company is my old school mate David Bowen. Gas is also generated in this mine in such quantity as to compel the use of safety lamps, and the same stern discipline as at Tredegar was noted. This is doubtless due to a lesson which came a few years ago at a mine not more than a mile away. Carelessness on the part of some poor fellow who was instantly summoned to face his God, cost over three hundred lives, and two hundred and forty bodies found a dark grave in the veins of the pit, it being impossible to recover them.

The next mine visited was Llambradach colliery near Cardiff, the temporary home of the honored ex-president of the Institute, Mr. Anthony Howells, who is consul at that place. The pit is one thousand six hundred and fifty feet deep, the coal is seven feet thick, and as in the others, the long wall system is in use. Mr. Bradford is manager and Mr. Greer colliery manager. Cables were used for hauling until recently throughout the mine but now

horses bring the coal to the double partings, where it is attached to the cable. The change was made as a stroke of economy. The machinery at the mine is of the latest pattern and the fan is a beauty.

The great Mardy colliery, four miles from Abardare, is perhaps the finest mine in South Wales. It is owned by Hon. William Thomas, who resides at a beautiful country place known as Bryan Awel. I called on him, told him that I was from Ohio, and wanted to see the mine. He greeted me cordially, and accompanied me to the colliery. We were there greeted by his son James L. Thomas, who is the manager in charge. He showed me the plant and pointed out that not a stick of timber had been used in its erection. There was only iron, steel and stone. Even the cottages of the miners being built of the stone, so plentiful in that region. The village abounds with comforts and convenience for the men, there being an excellent library, created and maintained by the company. The distance from the surface to the bottom of the pits is one thousand five hundred feet, and everything about them is kept in the best possible condition. The machine and carpenter shops are models of convenience and the blacksmith shop is one of the neatest spots about the place. The lamp room is in the main office building, and here every lamp is examined before the miner gets it in the morning. It is locked before being handed to him, but to make assurance doubly sure another inspection is made at the bottom of the shaft where a room is built for that purpose. The arrangement for the handling of a large amount of coal at the bottom of the pit is perfect, as is the machinery and appliances. The fan is a mammoth one with a capacity of two hundred and ninety-five thousand cubic feet through the working faces every minute. The seam is seven feet and the manner in which loaded cars are handled is quick and satisfactory. Cables are used to the best advantage that I have ever seen, and a long tramp through the mine convinced me that the manager knows his business, and has taken advantage of every advancement. He is a man who could readily make friends with an American, for he was here a few years ago with a party of English engineers and was greatly pleased with what he saw in this country. So thorough is the system of the company that the officer in charge knows how much grain each horse consumes at a meal.

The Pen Tews colliery I visited in company with Mr. David Bowen, of Abercam. It is located near Pointipool in Monmouthshire, and is one thousand eight hundred feet deep. Like the others they use the wall system and safety lamps, but one of the remarkable features of the mine is the fan. The belt wheel is twenty-four feet in diameter, and in the circumference are ten

grooves in which are as many ropes, known as the Egyptian cotton ropes. A twin compound engine provided power, but was so arranged that each could be run independent of the other. There were two of these engines, one on each side of the fan, in order that one might be quickly placed in operation should the other fail. The current would scarcely be slack, for the operation was done in a minute. The amount of air forced through the mine is three hundred thousand cubic feet per minute. Mr. B. Nicholas is the manager.

Flanerch colliery is another good mine, or rather was at one time. An explosion there a short time ago killed two hundred and forty miners and little work was being done.

At Cul Fynynydic, another mine not far away, there were only sixteen miners at work. They were making repairs. The colliery being in an awful condition because of an explosion which damaged the mine and killed three hundred and seven men in September, 1894. The last colliery I saw in Wales was the Hanis plant in Glenmorganshire. It was also the deepest, being two thousand three hundred and ninety feet from the top to the bottom, and one of the finest mines of the world.

Here is where I left Wales and went to the North of England. The Belklow Vaughn Company there own the largest colliery in the kingdom at Grangetown, two miles from Middlesboro in Yorkshire. They have fifteen collieries where coal is mined and one from which comes iron ore. All are worked on the same plan and not one is made to look better than the other, for each is as well kept as money and brains can keep it. David Evans, the general manager, is a genial gentleman and one of the notable mining engineers of England. The iron ore mine is at Grange-town on the German ocean and is made up of three slopes. The seam is sixteen feet thick and worked on the stall and pillar system. Naked lights are used by the men, the first place in the country where I saw them. Here also is a system of haulage that for economy cannot be beat. Cables brought the ore in two ton cars to the bottom of the slope where an appliance knocked off the coupling and the cars slipped gently on their way to the incline. There a man made the attachment, and the trip went toward the open air. So perfect does their system work that five thousand tons are rolled out every day. The mine is ventilated by a great furnace which keeps a good steady current.

The Durmont colliery, owned by the Courett Iron Company in County Durham, was another place of interest to me. J. H. Morris, an eminently practical man is the engineer in charge, and he took me down the shaft six hundred feet to the bottom. There

are employed here two hundred and thirty men, who get out seven hundred tons of coal every day. The coal is hauled from two districts, the same engine handling both, main and tail ropes being used. The engine is a double horizontal engine with eighteen inch cylinder, three foot stroke and five foot drums connected by clutch gearing. There is no gas in the mine, and the use of naked lights about the foot of the shaft allows a splendid arrangement. The stables are as fine as any livery barn in Ohio, and the horses are walked through a huge tank filled with water every night. This washes their feet before they are taken to the stable, and the water is changed every three days. A furnace ventilates the mine. It is nine feet high, eight feet wide, with six feet from the bars to the spring of the arch. Ninety thousand cubic feet of air is the capacity. The mine is worked on the stall and pillar system, much after the manner we mine coal in Ohio. These last two mines are the only ones I visited where they use naked lights.

Menaced on every hand by danger and surrounded by perils that have required generations to brave and control, there is little doubt that the mining engineers of Great Britain have advanced in their professions. To them has come problems involving the safety of life and treasure, and they have met them like the well educated gentlemen they are.

They know how to mine coal and mine it successfully and the reward of their labors is seen in some of the finest and best conducted mines of the world.

(On motion of Mr. Jones, a vote of thanks was extended to Captain Morris for his interesting paper.)

As the afternoon was well advanced, it was decided to postpone the reading of Mr. Love's paper and the discussion thereon until the evening visit to the University for the purpose of viewing the new observatory at that institution.

Election of officers resulted as follows:

President.....	Prof. F. A. Ray.
Vice-President .....	Henry Price.
Secretary-Treasurer.....	R. M. Haseltine.
Executive Committee:	Prof. N. W. Lord, John, Kane, Capt. J. L. Morris.

The following named persons were elected to membership in the Institute: Edward Johnson, Columbus; Charles Thomas,

Schenectady, N. Y.; Hugh Mullin, Carbondale, Ohio; Victor Gutzu, Bucarest, Roumania; J. L. Wagner, Columbus, Ohio.

PROFESSOR RAY: Our newly elected member, Mr. Gutzu, is a trained engineer from Roumania, and I think it would be interesting to hear what he has to say.

MR. VICTOR GUTZU: I beg pardon if my English is not perfect. I have been in this country only eight weeks. A few days ago Dr. Edward Orton, Professor of Geology at the O. S. U., told me of this meeting of Mining Engineers and advised me to attend the sessions of this Institute in its convention.

I have been present at every session of the convention and have followed with great interest for myself every paper given and discussed by the different members of the Institute, and everything has proved to me that a man can learn a good deal of science in this way.

I am a young mining engineer, graduated six months ago from the Mining School of Bucarest, Roumania, and have been sent by my government to learn methods of investigating oil and gas in America, or much better to learn from you, mining engineers, and from your professors.

Through Prof. Edward Cope of Philadelphia, I was introduced to Dr. Edward Orton, who, eminent and courageous man of science, as well known in Europe as in America, placed and yet places before me the light of science, without which to be a mining engineer is to be a dead letter of the alphabet. That science, well known to you, is Geology and its application to the earth. That science is the more interesting the more it is called upon to overturn new grounds like the grounds of Roumania, where almost nothing is known from the geological point of view.

From you, mining engineers, I shall learn the processes and methods of utilizing those grounds, and for these reasons I consider it a great honor accorded me by you, in electing me a member of your Institute.

I thank you very much. (Applause).

PRESIDENT ORTON: It is an interesting fact that Mr. Gutzu has been sent to America by his government to become versed in the best, latest and most scientific methods of handling the finest form of fossilized fuel of the world. This Institute has in the past devoted its study to another form, coal. Mr. Gutzu is interested in that of oil, and secondly gas. He comes from a country naturally rich in resources of that kind, and yet in the very earliest stages of development; and the thing we are proud of is that he comes to Ohio to be trained in the business.

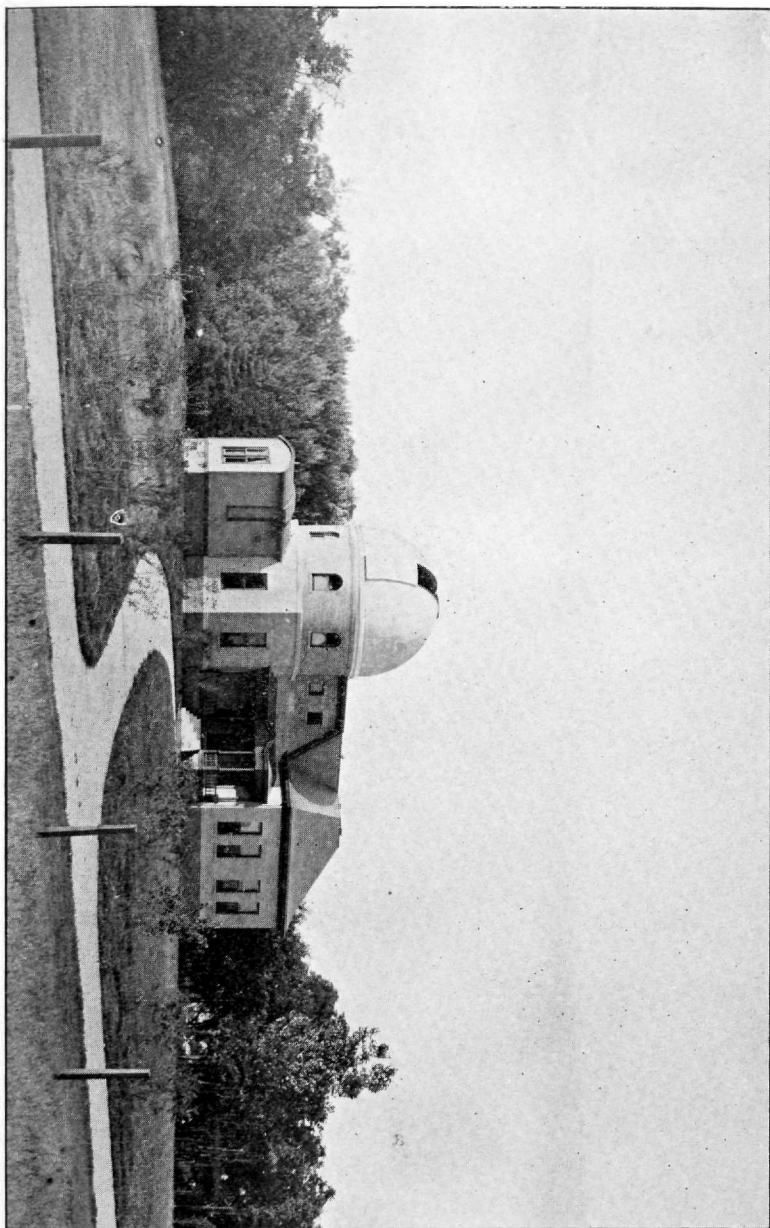
Committee on Resolutions reported that they were not ready to submit a report, and were held until they should file their report with the Secretary.

MR. KANE: I think we would be lacking in the amenities of the occasion and the courtesy due from us to our retiring president and other officers, did we permit this occasion to slip by without expressing our thanks and appreciation of the valuable services rendered this Institute. I feel that I, as an individual and as a member of this Institute, owe a deep debt of gratitude to the worthy son of a worthy sire who has given us, as president of the Institute, the benefit of his influence and learning. I therefore move a hearty vote of thanks to him and an expression of regret at his retirement from the presidency of the Institute, and a wish that he may attain the height of success and prosperity in whatever sphere he finds himself when he leaves the chair of this Institute. (Carried).

PRESIDENT ORTON: Gentlemen, I accept this testimony of good will very thankfully, but I am sorry to say that Mr. Kane greatly magnifies what I have done for the Institute. What I have done for it has been cheerfully done, but is chiefly marked by what I have not done. I have so much to do and have interests in so diverse a line, that I have not been able to devote time or give personal force to the work of the Institute. The man selected to-day to fill the presidency is the man of all others fitted for it, and he ought to lead you onward and upward. It is a source of pleasure to me to resign the office to the future incumbent, Professor Ray.



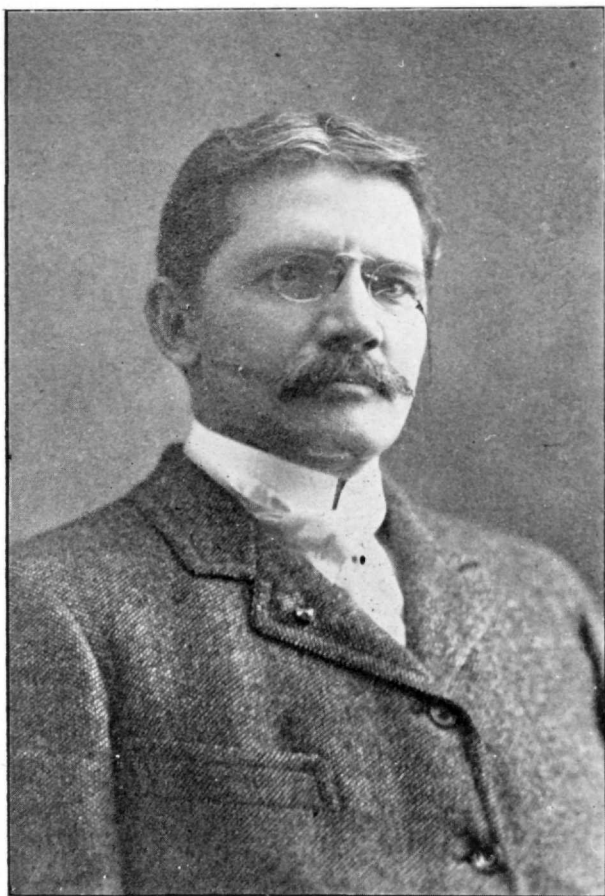
L. D. HASELTINE.



EMERSON MCMILLEN OBSERVATORY AT THE OHIO STATE UNIVERSITY, COLUMBUS, O.







COL. EMERSON McMULLEN.

THE SECOND PRESIDENT OF THE OHIO INSTITUTE OF MINING ENGINEERS.

TO WHOSE GENEROSITY THE UNIVERSITY AND THE STATE ARE  
INDEBTED FOR ITS OBSERVATORY.





PROF. HENRY C. LORD.

INSTRUCTOR IN ASTRONOMY AT THE EMERSON McMILLEN OBSERVATORY.  

(After completing details of arrangements for meeting at the Observatory at the Ohio State University in the evening, and for the excursion to the mines to-morrow, meeting, upon motion, adjourned.)

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### EVENING SESSION.

Observatory Building, O. S. U., January 23, 1896.

Upon the opening of the meeting, the following paper was read by Mr. Thomas H. Love.